The Sampler

January 31, 2017

The Sampler is a monthly e-newsletter produced by the Volunteer Lake Assessment Program.

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Web Highlights

This month's featured lake website is Powwow Pond Council, East Kingston, NH

Officials Warn of Ice Ridges on NH Lakes

Unleashing Rivers

Zooplankton Rapidly Evolve Tolerance to Road Salt

Upcoming Events

38th Annual Great Rotary Ice Fishing Derby
February 11th - 12th
Meredith, NH 03253

Winterfest 2017
Saturday February 18th, 2017
12:00 - 3:00 p.m.
Squam Lakes Association
534 Route 3
Holderness, NH 03245

2017 Farm and Forest Expo
February 17th - 18th, 2017
All Day
Radisson Hotel
700 Elm St.
Manchester, N.H. 03101

23rd Annual ELA Conference and Eco-Marketplace
Sustaining the Living

Lake Ice Out Data for New Hampshire

Kirsten Nelson, Biologist, NHDES Watershed Management Bureau

Cold winds and snow are blowing, despite the January thaw, winter has arrived in New Hampshire! This frosty season is a time of icy beauty in our state, as lakes and ponds freeze over and provide a platform for cross-country skiing, snowmobiling, and ice fishing. But before we know it, spring will arrive, causing the snow and ice to melt and leave our lakes. "Ice out" is the term typically used to describe this phenomenon, when either the ice has melted and broken up enough to navigate a boat from one end of the lake to the other, or when a lake is entirely ice free, whereas "ice in" describes when ice completely covers a lake. Many New Hampshire lakes have historical ice out records dating back to the early 1900's, and some, like Lake Sunapee and Lake Winnipesaukee, date back to the 1880's!

Consistently recording ice out information, and ice in data when possible, is incredibly important. These data help track climatological trends, as well as help interpret summer lake conditions. The day of ice out can vary greatly from year to year, which makes keeping a long-term dataset even more crucial (Figure 1). A record of the day of ice out that extends for decades helps break through the "noise" of the dataset and allows scientists and lake managers to find hidden trends. While some lake association groups determine ice out to when the lake is navigable by boat and others determine ice out to be when the lake is entirely ice free, the most important aspect of the data collection is *consistency*, meaning that the same criteria for ice out is meet each year.

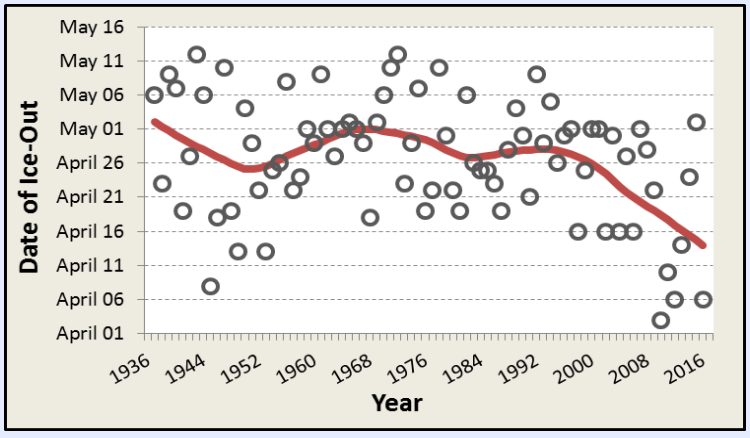

Figure 1. Ice Out at Stinson Lake, Rumney, NH from 1937 – 2016. A Loess smoothing line was utilized to display the general trend of the date of ice out.

Landscape
March 8th - 9th, 2017
All Day
UMass Murray D. Lincoln Campus Center
Amherst, MA

2017 NH Water and Watershed Conference
Friday March 24th, 2017
Plymouth State University
Plymouth, NH 03264

NEAEB 2017
March 14-16, 2017
Hilton Hartford Hotel
Hartford, CT 06103

Save the Date!
2017 VLAP Workshop
Saturday May 20, 2017
NHDES
29 Hazen Dr.
Concord, NH 03301

Lakes Congress
June 1st - 2nd, 2017
Church Landing at Mills Falls
Meredith, NH 03253

Grants

NH Charitable Foundation

New England Grassroots Foundation
Seed and Grow Grants

Limno Lingo

Quaking Bogs: Formed around deep pond depressions, such as kettle ponds, with a small surface area. These bogs are primarily made up of Sphagnum moss that form thick floating mats from the littoral zone towards the center of the pond. The Sphagnum mats are able to hold several times their weight and can be walked upon creating a "quaking" sensation. Sphagnum bogs are acidic environments with low salinity that support a variety of algal species and some protozoans and zooplankton, however larger animals have not

Analyzing long-term ice out records at many New England lakes has found that the day of ice out is changing. New England lakes are experiencing, on average, earlier ice out days (Figure 2). Ice out is largely determined by air temperature, but can also be influenced by snow cover, cloudiness, and wind. Earlier ice out is associated with our changing climate, caused by ever-increasing levels of carbon dioxide in our atmosphere.

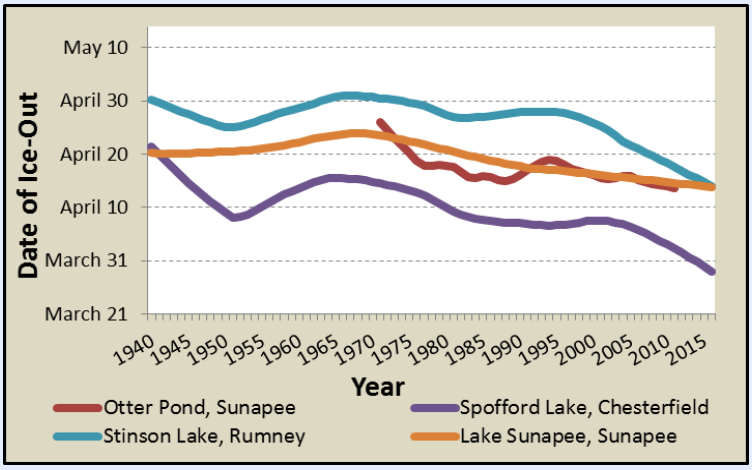

Figure 2. Averaged ice out date for four New Hampshire waterbodies from 1940 – 2016 that had ≥40 consecutive years of ice out data. A Loess smoothing line was utilized to display the general trend of the date of ice out for each waterbody.

The occurrence of ice out earlier in the year has economic and environmental implications. Thinner ice and fewer days of ice cover reduce the days available for ice fishermen to practice their sport, as well as limits snowmobilers and cross country skiers. Environmentally, earlier ice out allows water to begin warming sooner, stimulating phytoplankton (algal) productivity. While this will reduce winter anoxia and reduce the chance of a winter fish kill due to low oxygen, fish will have to contend with lower dissolved oxygen levels in the summer, as well as less habitat for coldwater fish species. Additionally, earlier ice out will result in hotter summer water temperatures, lower water levels due to increased evaporation, and prolonged summer lake stratification, creating longer periods and/or greater areas of hypolimnetic anoxia. These changes are favorable for eutrophication of waterbodies and for cyanobacteria, increasing the likelihood of cyanobacteria blooms in New Hampshire lakes.

In 2011, The Volunteer Lake Assessment Program (VLAP) at New Hampshire Department of Environmental Services (NHDES) began asking volunteers and lake associations for historical ice out records after realizing a central repository for this information did not exist on a state-wide basis. Since then, VLAP has acquired records from over 60 New Hampshire lakes. Collecting ice out information is ongoing, and VLAP has created an easy to use on-line form to enter ice out data. Once the data have been entered, historical records for each lake are stored electronically and available upon request for use in lake association publications, scientific research, and articles.

So what are you waiting for? Ask the record keeper at your lake to enter the data, or if you don't have data, start collecting it!

adapted to the
environment.

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